



4910-06-P

DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

Information and Guidance on the Inspection, Testing, and Maintenance of Emergency Window Exits on Railroad Passenger Cars

AGENCY: Federal Railroad Administration (FRA) Department of Transportation (DOT).

ACTION: Notice.

SUMMARY: FRA has become aware of occurrences when emergency window exits on passenger cars did not operate as intended because the emergency pull handle became detached from the window gasket when pulled, the gasket tore into multiple pieces, or the gasket was otherwise difficult to remove. While investigating these occurrences, FRA discovered that some railroads were not following, or did not clearly understand, the existing Federal regulations on the inspection, testing, and maintenance (ITM) of these window exits, particularly the requirement that a railroad must utilize a test sampling method that conforms with a formalized statistical test method. FRA does not believe any of these occurrences involved passengers or precluded passengers from opening a window in an emergency situation. However, in light of these concerns, FRA is issuing this document to provide information and guidance to railroads operating passenger train service on the existing regulatory requirements regarding ITM of emergency window exits.

FOR FURTHER INFORMATION CONTACT: Mr. Daniel Knote, Staff Director, Passenger Rail Division, Office of Railroad Safety, FRA, 1200 New Jersey Avenue, SE., Washington, DC 20590, (631) 965-1827; or Mr. Michael Hunter, Trial Attorney, Office of Chief Counsel, FRA, 1200 New Jersey Avenue, SE., Washington, DC 20590, (202) 493-0368.

SUPPLEMENTARY INFORMATION:

I. Historical Background on Existing Requirements

The current ITM requirements for emergency window exit operability are found in Title 49 Code of Federal Regulations (CFR) 238.113(e) and 238.307(c)(4)(i)(B).¹ These sections require each passenger railroad to test (at an interval not to exceed 184 days, as part of the periodic mechanical inspection) a representative sample² of its passenger car emergency window exits to determine they “operate as intended” and “properly operate,” respectively. Title 49 CFR 238.113(e) further requires the sampling method to “conform with a formalized statistical test method.”

As FRA explained in Emergency Order 20 (EO 20), a February 16, 1996, passenger train accident in Silver Spring, Maryland, involving a cab car on fire that filled with smoke, raised concerns that at least some of the train occupants could not exit

¹ Before FRA’s November 29, 2013, Passenger Train Emergency Systems II final rule (78 FR 71786), the requirement to test a representative sample of emergency window exits was in 49 CFR 239.107(b)(2) and required each passenger railroad “to verify that they are operating properly.”

² The requirement to test a representative sample of emergency window exits, which was based in large part on Emergency Order No. 20 (EO 20), was codified by FRA’s May 4, 1998, Passenger Train Emergency Preparedness final rule (E-Prep final rule). See 63 FR 24630, 24669-24670; EO 20, Notice No. 1, 61 FR 6876, 6881, Feb. 22, 1996, and Notice No. 2, 61 FR 8703, Mar. 5, 1996.

through the windows.³ This accident demonstrated why emergency windows must be readily identifiable and operable when needed.

FRA has continually reminded railroads that these windows “provide an additional means of egress in life-threatening situations requiring very rapid exit, such as an on-board fire or submergence of the car in a body of water.” See Passenger Train Emergency Systems (PTES) II final rule (78 FR 71786, 71802). In FRA’s February 1, 2008, PTES final rule, FRA reminded railroads of the requirement to test emergency window exits using commonly accepted sampling techniques⁴ to determine how many windows to test. See 73 FR 6370, 6384. In doing so, FRA reemphasized that sampling should be conducted to meet a 95-percent confidence level that no defective units remain after completing the tests for the windows in the sample. See id. Further, in the Passenger Train Emergency Preparedness (E-Prep) final rule, FRA stated that each railroad should “properly consider the nature and characteristics of its operations and passenger equipment to plan for routine and scheduled inspection, maintenance, and repair.” 63 FR 24669. FRA also made clear its expectations regarding the inspection and maintenance of emergency exits:

Visual inspections must be performed periodically to verify that no emergency exit has a broken release mechanism or other overt sign that would render it unable to function in an emergency. Maintenance,

³ The National Transportation Safety Board’s (NTSB) Railroad Accident Report on this accident reported that it took a Safety Board investigator several minutes to remove the left-side, front emergency window exit of the last passenger coach in the train’s consist. See NTSB/RAR-97/02 report at 17 (July 3, 1997). An NTSB investigator could not remove the same car’s right-side, rear emergency window exit, which was later removed by another investigator after approximately 3 minutes of physical exertion. The report further noted that the lubricant used to install these windows had hardened over time.

⁴ Railroads should conduct their sampling under either Military Standard MIL-STD-105(E), “Sampling for Attributes” (formally cancelled by the U.S. Department of Defense, but still acceptable for FRA’s representative sampling purposes) or acceptable non-Government, standard sampling procedures and tables for inspection by attributes, such as the American National Standards Institute (ANSI)/ASQC Z1.4-1993, “Sampling Procedures for Inspections by Attributes.” See 73 FR 6370, 6384.

including lubrication or scheduled replacement of depreciated parts or mechanisms, must be performed in accordance with standard industry practice and/or manufacturer recommendations. All emergency exits that are found during the course of an inspection or maintenance cycle to be broken, disabled, or otherwise incapable of performing their intended safety function must be repaired before the railroad may return the car to passenger service.

Id.

II. FRA Review of Railroads' Emergency Window Testing Programs

When FRA reviewed various railroads' emergency window exit testing programs, it discovered that some railroads were not following, or did not clearly understand, the Federal regulations on the ITM of emergency window exits. This was particularly true with respect to adopting a sampling method that conforms with a formalized statistical test method and to recording window test failures. As a result, FRA is providing this guidance to ensure all railroads have in place an appropriate window testing program and understand which window tests they must record as failures.

Specifically, FRA considers a window to have failed testing if the window or a window component (e.g., gasket, pull handle) does not operate as intended, considering both the window design and whether the window removal was "rapid and easy" when opened in a manner simulating a passenger trying to remove the window in an emergency (e.g., to escape a car on fire). Examples of window test failures some railroads were not categorizing as such include situations where the emergency pull handle separated from the gasket, or where the gasket tore or needed to be removed in multiple pieces.⁵ In addition, FRA observed one railroad testing its windows by carefully pulling out the

⁵ FRA makes clear that for any window that is intentionally designed with one or more counter-intuitive features (such as an emergency pull handle that separates from the gasket when pulled, or a gasket that needs to be removed in multiple pieces), the railroad must ensure that such features are clearly explained in the required operating instructions posted for the affected emergency window exits.

window gasket to try to avoid detaching the handle or damaging the gasket. FRA recognizes that many railroads prefer to reinstall the same gaskets and handles for the emergency windows after performing the tests. However, FRA makes clear it does not consider such a careful test to be properly conducted because a passenger would not act that way in an emergency.

FRA also discovered that some railroads believed they were not required to formally adopt a sampling program because they were testing 100 percent of their emergency window exits over a 1- to 2-year period. FRA appreciates these railroads' efforts for what they believed was going above and beyond what is considered a reasonable sample size. However, FRA makes clear that for a railroad to truly test 100 percent of its windows, the railroad would need to test all of the emergency windows in each of its cars at least once during a 184-day period. FRA also clarifies that simply testing 100 percent of the emergency window exits does not necessarily ensure that the windows will operate as intended when needed in an emergency situation. As discussed in this document, it is how a railroad characterizes the results of those tests and what a railroad does with the results of those tests that will help ensure the windows will operate as intended.

Choosing the number of windows to test (whether it is 20 percent or 100 percent) is only the first step. Second, if testing fewer than 100 percent of the windows in a 184-day period, railroads must also ensure the sample is representative of the various window types in its fleet or fleets.⁶ Third, even if a railroad is testing 100 percent of its emergency window exits, it must have a program in place that requires monitoring of the

⁶ Railroads can easily set up a simple spreadsheet (using off-the-shelf software) to generate a random sample that includes windows representing all of the window types in a railroad's fleet or fleets.

tests to determine whether the test results demonstrate a 95-percent confidence level that all emergency window exits operate as intended. Although EO 20, Notice No. 1, would have required testing all window exits on a specific series or type of car if one such car had a defective window exit, the amended order, Notice No. 2, permitted the use of commonly accepted sampling techniques to determine how many additional windows to test. See 61 FR 8703, 8705. In general, these principles require that the greater the percentage of windows initially found defective, the greater the percentage of windows the railroad will have to test.

FRA expects all railroads to: (1) Conduct periodic reviews of records of window testing using an acceptable attribute sampling method to determine whether they are achieving a 95-percent confidence level that no defective units remain;⁷ (2) assess the probable cause of any window test failures; and (3) address any such failures. In setting up their testing programs, railroads must set the confidence level of the sample at 95 percent or more and set the defect (failure) rate at less than 5 percent.⁸ To perform their analyses, railroads must review the test results at the end of a sampling period (at a minimum) and take further action if the testing reveals that 5 percent or more of the windows in the sample are defective. When assessing the probable cause(s) of any window test failures, railroads should consider whether the failures are a result of design issues, useful life issues, or other systemic issues common to a particular window design or windows in service of a similar age. If the test failure appears to be due to a systemic issue, then the potential exists for the failure to repeatedly present itself. In such cases,

⁷ Although the goal is to have no defective units remaining in a railroad's emergency window population, FRA recognizes that because the railroad is performing a statistical sample that achieves a 95-percent confidence level, there will always be a possibility that some defective units remain.

⁸ These numbers are not intended always to add up to 100.

FRA strongly urges that the railroad consider replacing all the emergency windows or window components of like design or similar service age, as applicable.

As stated in the E-Prep final rule, a railroad must repair any window found to be broken, disabled, or otherwise incapable of performing its intended safety function before the railroad may return the car to passenger service. See 63 FR 24669. This remains true even when the number of windows that failed is below the 5-percent defect rate threshold. Railroads should also document the remedial action(s) planned or taken to address the window test failures, and create a timetable for window inspection and replacement for the window type or car series to remedy the problem in the most expedient manner.

III. Maintenance of Emergency Window Exits

As noted above, FRA expects railroads to periodically perform visual inspections to verify no emergency window exit has a broken release mechanism or other overt indication that would render it unable to function in an emergency. Ideally, railroads would incorporate these visual inspections as part of the interior calendar day mechanical inspections of passenger cars, since they already need to inspect the window markings daily to ensure that the safety-related signage is in place and legible. See 49 CFR 238.305(c)(7). As demonstrated by the 1996 accident that led to EO 20 (in which some of the window gaskets could not readily be pulled out due to lack of lubrication and maintenance), it is important that maintenance, including lubrication or scheduled replacement of degraded parts or mechanisms, be performed using standard industry practice and/or manufacturer recommendations to ensure that window exits will operate as intended during an emergency. This will also help to prevent a situation where a

passenger in an emergency would panic or be delayed by trying to determine how to remove a window after the pull handle breaks off or a piece of the gasket tears off, for example.

Finally, FRA discovered in its investigations that some employees were installing the window gaskets with a sharp tool (such as a screwdriver), which may have damaged the gaskets and may explain why, when pulled, the gaskets were not coming out in one piece as designed. Therefore, to ensure that railroads perform proper maintenance, the railroads should ensure that employees have and use proper tools when installing emergency windows to avoid damaging the window gaskets.

As noted previously, FRA is issuing this document to provide basic information and guidance to railroads operating passenger train service to ensure that they understand the existing regulatory requirements regarding the ITM of emergency window exits. FRA believes that compliance with the existing emergency window exit regulatory requirements will help ensure the safety of the Nation's railroad employees, passengers, and the general public. FRA may take other appropriate actions it deems necessary to ensure the highest level of safety, including pursuing other corrective measures under its rail safety authority.

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Robert C. Lauby,
Associate Administrator for Railroad Safety
Chief Safety Officer.

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